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Structure and interrelations of winter large-scale circulation processes in the troposphere and stratosphere of the northern hemisphere midlatitudes

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Abstract

Daily values of the Kats zonal index calculated at standard pressure levels 500, 300, 100, 30, and 10 hPa in the Atlantic-European, Asian, and American sectors of the northern part of the midlatitude zone in the Northern Hemisphere (50-70°N) for the 14-year period (1976-1990) have been used to study a variability of the intensity of zonal circulation in the cold season (October-March). Influence of winter stratospheric warmings on the structure and dynamics of macrocirculation processes is found. The character of vertical interrelations between tropospheric and stratospheric layers at various frequencies of zonal index oscillations is established on the basis of spectral and correlation analyses.